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[RUSH] **MESSAGE:** Print quality of claimset is very poor. (missing characters). Please provide clearer claim set.

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REV 10/04

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
Attorney Docket No. 005245.00001

In re U.S. Patent Application of Anand Kannan	)	
	)	
Application No. 09/745,301	)	Examiner: Bayard, Emmanuel
	)	
Filed: December 22, 2000	)	Art Unit: 2638
	)	
For: METHOD AND APPARATUS FOR ERROR REDUCTION IN AN ORTHOGONAL MODULATION SYSTEM	)	

Allowed Claims

1. A method for error reduction in a communication system comprising a plurality of communication devices and a plurality of orthogonal subcarriers, the method comprising steps of:

determining, by a first communication device of the plurality of communication devices, an equalization function that reduces a multipath delay of a received signal;

receiving, by a second communication device of the plurality of communication devices, subcarrier suppression information;

suppressing, by the second communication device, an orthogonal subcarrier of the plurality of orthogonal subcarriers based on the received subcarrier suppression information to produce a suppressed subcarrier and a non-suppressed subcarrier;

transmitting, by the second communication device, a signal comprising at least the non-suppressed subcarrier to produce a transmitted signal;

receiving, by the first communication device, the transmitted signal to produce the received signal; and

processing, by the first communication device, the received signal based on the determined equalization function.

2. The method of claim 1, further comprising steps of:

determining, by the first communication device, a signal quality metric for each subcarrier of the plurality of orthogonal subcarriers to produce a plurality of signal quality metrics;

transmitting, by the first communication device, subcarrier suppression information based on the plurality of signal quality metrics; and

wherein the subcarrier suppression information received by the second communication device comprises the subcarrier suppression information transmitted by the first communication device.

3. The method of claim 2, further comprising a step of determining an order of the plurality of orthogonal subcarriers based on the determined signal quality metrics, and wherein the step of suppressing a subcarrier comprises a step of suppressing a subcarrier of the plurality of orthogonal subcarriers based on the determined order to produce at least one suppressed subcarrier and at least one non-suppressed subcarrier.

4. The method of claim 2, further comprising a step of comparing at least one determined signal quality metric to a signal quality metric threshold to produce a comparison, and wherein the step of suppressing a subcarrier comprises a step of suppressing an information bearing subcarrier of the plurality of information bearing subcarriers based on the comparison order to produce at least one suppressed subcarrier and at least one non-suppressed subcarrier.

5. The method of claim 1, further comprising a step of determining a quantity of orthogonal subcarriers for suppression in order to reduce a transmitted power level below a predetermined power level threshold, and wherein the step of suppressing an orthogonal subcarrier comprises a step of suppressing the determined quantity of orthogonal subcarriers to produce at least one suppressed subcarrier and at least one non-suppressed subcarrier.

6. The method of claim 1, wherein the step of determining an equalization function comprises steps of:

determining a channel transfer function;

determining a desired composite communication channel transfer function;

determining an equalization function based on the determined channel transfer function and the desired composite communication channel transfer function, wherein the equalization function reduces the multipath delay of the received signal when the multipath delay of the received signal exceeds a predetermined multipath delay.

7. The method of claim 6, wherein a convolution of the equalization function with the estimated channel transfer function produces a desired composite communication channel transfer function that comprises the predetermined multipath delay.

8. The method of claim 6, wherein the determined channel transfer function comprises a greater multipath delay than the predetermined multipath delay of the desired composite communication channel transfer function, and wherein the equalization function reduces a multipath delay of a received signal.

9. The method of claim 1, wherein the first communication device comprises a plurality of antennas, wherein the step of determining an equalization function comprises a step of determining, by a first communication device of the plurality of communication devices, a plurality of equalization functions that together reduce a multipath delay of the transmitted signal, wherein the step of receiving comprises a step of receiving, by the first communication device, the transmitted signal via each antenna of a plurality of antennas to produce a plurality of received signals, and wherein the step of processing comprises a step of processing, by the first communication device, each received signal of the plurality of received signals based on a determined equalization function of the plurality of determined equalization functions.

10. The method of claim 9, wherein the step of determining a plurality of equalization functions comprises steps of:

determining a plurality of composite equalization functions, wherein each composite equalization function of the plurality of composite equalization functions comprises a plurality of equalization functions that together reduce a multipath delay of the transmitted signal;

determining an optimal composite equalization function from among the plurality of composite equalization functions; and

determining a plurality of equalization functions based on the determination of an optimal composite equalization function.

11. The method of claim 10, wherein the step of determining an optimal composite equalization function comprises steps of:

for each composite equalization function of the plurality of composite equalization functions, determining a signal-to-noise ratio (SNR) for at least one subcarrier of a signal received by the first communication device to produce determined SNR's;

for each composite equalization function of the plurality of composite equalization functions, determining a minimum SNR from among the determined SNR's;

determining a maximum SNR from among the minimum SNR's determined for each composite equalization function of the plurality of composite equalization functions to produce a determined maximum SNR; and

determining an optimal composite equalization function based on the composite equalization function corresponding to the determined maximum SNR.

12. A method for error reduction in a communication system comprising a plurality of orthogonal subcarriers, the method comprising steps of:

utilizing a guard band interval to ameliorate intersymbol interference;

determining a signal quality metric for each orthogonal subcarrier of the plurality of orthogonal subcarriers to produce a plurality of signal quality metrics;

determining a quantity of orthogonal subcarriers for suppression in order to reduce a transmitted power level below a predetermined power level threshold; and

suppressing an orthogonal subcarrier of the plurality of orthogonal subcarriers based on a signal quality metric of the plurality of signal quality metrics that includes a step of suppressing the determined quantity of orthogonal subcarriers to produce at least one suppressed subcarrier and at least one non-suppressed subcarrier.

13. The method of claim 12, wherein the step of suppressing an orthogonal subcarrier comprises steps of:

determining an order of the plurality of orthogonal subcarriers; and

suppressing an orthogonal subcarrier of the plurality of orthogonal subcarriers based on the determined order.

14. The method of claim 12, wherein the step of suppressing an orthogonal subcarrier comprises steps of:

comparing at least one signal quality metric of the plurality of signal quality metrics to a signal quality metric threshold to produce a comparison; and

suppressing an orthogonal subcarrier of the plurality of orthogonal subcarriers based on the comparison.

15. The method of claim 12, wherein the communication system further comprises a transmitting communication device that transmits user information and a receiving communication device that receives user information, wherein the step of determining a signal quality metric is performed by the receiving communication device, and wherein the step of suppressing a subcarrier is performed by the transmitting communication device.